SJSU Undergraduate Research Grants

Research of Biologically Natural Products from Emmenanthe penduliflora “Whispering Bells”

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Abstract
The goal of our project is to investigate and learn about potential bioactive chemicals in California Native Plants. This study involves the plant Emmenanthe penduliflora also known as “Whispering Bells”, an interesting native species whose seeds only germinates after being exposed to a wildfire. In this study, we describe our work to test for toxicity and antimicrobial that the plant potentially possess and to isolate potential active bioproducts.

E. penduliflora BSTA and antimicrobial results

<table>
<thead>
<tr>
<th>Sample Fraction</th>
<th>ID #</th>
<th>**10 ppm (pg)</th>
<th>**100 ppm (pg)</th>
<th>SD</th>
<th>Avg % Death (10 ppm)</th>
<th>Avg % Death (100 ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oudie Sample</td>
<td>0NP</td>
<td>3.96</td>
<td>7.16</td>
<td>± 0.05</td>
<td>40.17</td>
<td>80.72</td>
</tr>
<tr>
<td>Hexane Fraction</td>
<td>0NP</td>
<td>2.89</td>
<td>6.56</td>
<td>± 0.05</td>
<td>39.14</td>
<td>60.55</td>
</tr>
<tr>
<td>Ethyl Acetate Fraction</td>
<td>0.77</td>
<td>1.28</td>
<td>3.055</td>
<td>± 0.05</td>
<td>5.14</td>
<td>9.39</td>
</tr>
<tr>
<td>Aqueous Methanol Fraction</td>
<td>0NP</td>
<td>3.78</td>
<td>7.56</td>
<td>± 0.05</td>
<td>40.17</td>
<td>80.72</td>
</tr>
</tbody>
</table>

* Indicates how many strains are dead out of 0-12 strains inside of each well.

Antimicrobial assay result

Sample Fraction
- Hexane Fraction
- Ethyl Acetate Fraction
- Aqueous Methanol Fraction

Amplifin (positive control)
- 15
- 40

Conclusion
We have found that hexane and ethyl acetate extracts of E. penduliflora contains one or more compounds which are active against BSTA and antimicrobial test respectively. Future studies will involve purification and structural analysis of the active chemical compounds. As far as can be determined, E. penduliflora has not previously been investigated for presence of bioactive compounds.

Acknowledgements & References
- Lars Rosengreen, College of Science Green House Manager
- Justin Dang
- SJSU Undergraduate Research Program

Experimental Methods

Extraction and Partial Purification

To the Aquous Layer
- Add 2 x 15 mL of ethyl acetate

To the Ethyl Acetate
- Add 1 x 15 mL of ethyl acetate

Prevent evaporation: a device to evaporate liquid without using heat.

Antimicrobial assay

Antimicrobial assay was performed using disc diffusion method. 6mg of sample was dissolved in 20μL of 100% ethanol and transferred onto sterile 6mm filter disc. The ethanol was removed under vacuum.

Petri dishes with nutrient agar was prepared and 100μl of Escherichia coli broth was plated onto the prepared media.

Finally discs were placed onto the surface of agar. The plates were inverted and incubated at 37°C overnight.

Results are read by measuring the diameter of zone of inhibition.

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